

THE GREEN STANDARD

Environmental Product Declaration

In accordance with ISO 14025



Convert[™] Design Platform by *Interface*FLOR[®]

Modular carpet tile made with post-consumer
content type 6 nylon and post-consumer
content non-virgin PVC backing.

0.1 Product classification and description

Product description

Modular carpet with post consumer recycled content Nylon 6 yarn face cloth combined with GlasBac®RE recycled backing.

Product styles

InterfaceFLOR Convert™ Design Platform - This includes the specific Blended™, Broomed™, Brushed™, Cap and Blazer™, Grooved™, Light box™, and Square Root™.

This product collection represents a significant advance in carpet manufacturing by incorporation of post consumer carpet yarn into the wear layer. Post consumer carpet is reclaimed through Interface's ReEntry® 2.0 program and the fibers are separated from backings. Fiber is then melted into Nylon granulate, combined with post industrial granulate, and virgin granulate and then extruded into new carpet yarn by Aquafil USA. In addition to yarn reclamation, reclaimed carpet tile backing is ground and used as the feedstock for GlasBacRE, the recycled vinyl backing for this group of products. The recycling of post consumer carpet yarn and backing back into new carpet represented in this product collection is a major accomplishment on the path to sustainable carpet construction.



0.2 Range of Application

Modular installation of textile floor covering in commercial buildings.

0.3 Product Standard

- | | |
|--|-----------------|
| • ASTM E-648 Radiant Panel | Class 1 |
| • ASTM E-662 Smoke Density | ≤ 450 |
| • AATCC -134 Static | < 3.0 KV |
| • AATCC 16-E Light fastness | ≤ 4.0 @ 60 AFUs |
| • AACHEN Din 54318 Dimensional Stability | <0.10 % |
| • EN14041 CE-Labeling | |

0.4 Accreditation

- ISO9001 Quality Management System
- ISO14001 Environmental Management System
- Platinum NSF140 Sustainable Carpet Assessment
- CRI Green Label Plus
- NVLAP Accreditation, NIST



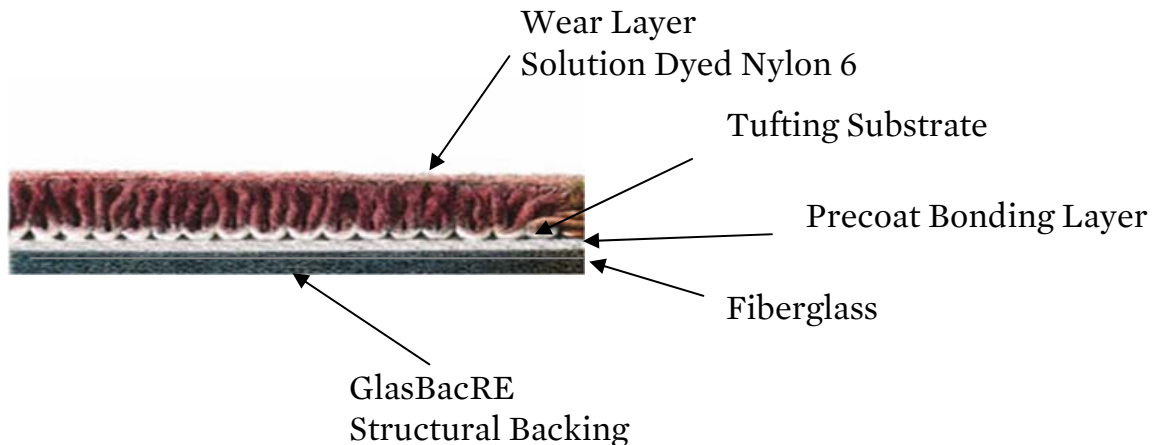
0.5 Delivery Status

Figure 1. Specification of product construction

Characteristics		
Type of manufacture	Tufted Textured Loop	
Yarn Type	Nylon 6 with post consumer and post industrial recycled content	
Characteristics	Nominal value	Unit
Pile fiber composition	Nylon 6	100%
Total thickness	7.5	mm
Total carpet weight	4420	g/m ²
Surface pile thickness	2.7	mm
Number of tufts or loops/dm ²	1660	loops/dm ²
Surface pile weight	659	g/m ²
Secondary backing	Recycled vinyl with fiberglass	

1 Material Content

Figure 2. Diagram of product construction



Definitions

- **Wear Layer** – Tufts of solution dyed, Nylon 6 yarns with high levels of recycled Nylon 6 from both post industrial Nylon and post consumer. The post consumer content is from reclaimed carpet, a significant advancement in carpet recycling. The source of the reclaimed carpet is Interface's extensive ReEntry carpet reclamation program.
- **Tufting Substrate** – a nonwoven polyester fabric, a tufting primary, into which the wear layer is tufted.
- **Precoat Bonding Layer** – a latex coating which bonds the tufts into the tufting primary
- **Glass** – a nonwoven fiberglass fabric which provides dimensional stability, a critical feature of modular carpet.
- **Structural Backing** – GlasBacRE, a post consumer recycled vinyl layer which gives structure and additional dimensional stability to the carpet tile. The source of the recycled vinyl is Interface's extensive ReEntry carpet reclamation program.

Figure 3. Material content of the product

Layer	Component	Material	Availability	Mass %	Origin
Wear Layer	Face Cloth/yarn	Nylon 6 Virgin	Fossil resource, Limited	13.25%	US
		Nylon 6 Post Industrial Recycled	Recycled material, Abundant	1.04%	US
		Nylon 6 Post Consumer Recycled	Recycled material, Abundant	0.60%	US
Tufting Substrate	Primary	Polyester	Fossil resource, limited	2.30%	US
Precoat Bonding Layer	Latex	EVA	Fossil resource, limited	4.92%	US
	Filler	CaCO ₃	Mineral resource, non renewable, Abundant	14.48%	US
	Foamer	Soap	Fossil resource, limited	0.28%	US
Glass Stabilization	Fiberglass	Silica	Mineral resource, non renewable, abundant	1.53%	US
Structural Backing	GlasBacRE Backing	Post Consumer recycled carpet tile	Recycled material, abundant	52.74%	US
		Post Industrial recycled vinyl		8.58%	US

1.2 Production of main materials

Post Consumer content Nylon 6

Produced by the shaving of fibers from post consumer carpet, pelletization of this fiber fluff, and extrusion into yarn in combination with post industrial recycled Nylon granulate and virgin Nylon granulate that was produced from the polymerization of caprolactam which is sourced from petroleum.

Polyester

Synthetic fiber material, often polyethylene terephthalate produced by the polymerization of terephthalic acid and ethylene glycol which are both sourced from petroleum.

Ethylene vinyl acetate

A copolymerization product of ethylene and vinyl acetate.

Calcium carbonate

Mineral filler from limestone deposits

Soap

Alcohol ethoxy sulfate

Glass

Produced by fusion of sand and other silicate fillers.

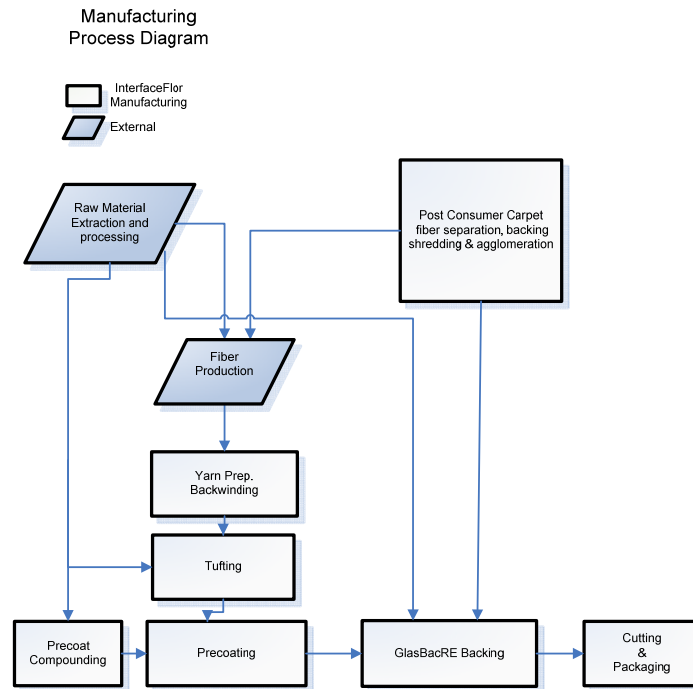
Post consumer recycled vinyl

Recovered post consumer vinyl backed carpet tile and other post consumer vinyl sources

2 Production of the floor covering

2.1 Production Process

Figure 4. Diagram of production process



2.2 Health, safety and environmental aspects during production

- ISO 14004 Environmental Management System
- PASS, a raw material review process that goes beyond ISO 14001 and considers all potentially regulated materials
- Sociometrics, measuring and improving social aspects of our business including worker safety
- Compliance with PHE (Public health and Environment) requirements within NSF140 Sustainable Carpet Standard.

3 Delivery and installation of floor covering

3.1 Delivery

An average distance to customers served is 500 miles.

3.2 Installation

Installation of this product does not require adhesive application, but is done using TacTiles preventing damage to the subfloor, increasing ease of removal and recycling, and installation during occupancy. For full installation instructions, see the InterfaceFLOR Installation Guide.



3.3 Health, safety and environmental aspects during installation

The VOCs associated with traditional flooring adhesives are avoided for both the installers and the building occupants by TacTile installation method. Carpet tile does not require a foam cushion underlayment used in traditional broadloom carpet installations. The TacTile method creates a floating floor, preventing damage to the subfloor and simplifying removal at end of life.

3.4 Waste

Waste is minimized by the modular aspect of the carpet tile and by the design pattern that allows for random installation. While installation waste can be sent to landfill or incineration, the preferred method is recycling through InterfaceFLOR's ReEntry 2.0 take back program. Contact InterfaceFLOR ReEntry at 888-733-6873 (US) or 866-398-3191 (Canada).

3.5 Packaging

Carpet tiles are packaged in recycled cardboard boxes (100% post consumer recycled content cardboard).

4 Use Stage

4.1 Use of the floor covering

The product is warranted for a service life of 15 years of heavy use. However carpets are often replaced before their service life expires due to fashion.

4.1.1 Cleaning and maintenance

Carpet and Rug Institute Carpet Maintenance Guidelines for Commercial Applications, which includes regular vacuuming and intermittent extraction cleaning. <http://carpet-rug.com/commercial-customers/cleaning-and-maintenance/index.cfm>

Level of Use	Cleaning Process	Cleaning Frequency	Consumption of energy and resources
Commercial (heavy traffic)	Vacuuming	Daily	Electric energy
	Extraction cleaning	Twice per year	Electric energy Water Detergent

4.1.2 Prevention of structural damage

Product is intended for commercial applications with heavy wear (CRI Test Method 101 appearance Retention Rating)

4.2 Health aspects during usage

Conforms to CRI Green Label Plus indoor air quality testing program. <http://www.carpet-rug.org/commercial-customers/green-building-and-the-environment/green-label-plus/carpet-and-adhesive>

5 Singular Effects

5.1 Fire

Radiant Panel: Class 1 (ASTM E-648)
Smoke Density: ≤ 450 (ASTM E-662)

5.2 Water Damage

The product backing is impervious to moisture protecting the subfloor from leaks and spills. Exposure to flooding for long periods may result in damage to the product.

5.3 Mechanical damage

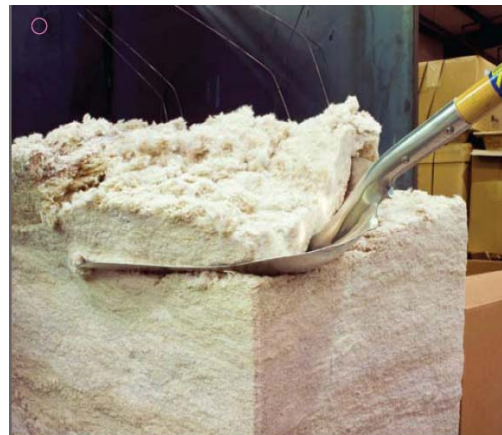
Product is intended for commercial applications with heavy wear (CRI Test Method 101 appearance Retention Rating <http://www.carpet-rug.org/commercial-customers/selecting-the-right-carpet/quality-and-performance/retention-rating-scales.cfm>). Product should be installed according to InterfaceFLOR installation guidelines.

6 End of Life

6.1 Recycling or reuse

Product should be recycled through Interface's ReEntry 2.0 process by contacting InterfaceFLOR ReEntry at 888-733-6873 (US) or 866-398-3191 (Canada).

InterfaceFLOR Reclamation & Recycling Process





6.2 Disposal

Recycling of the product through Interface's ReEntry 2.0 process is strongly recommended, but disposal in municipal landfill or commercial incineration facilities is permissible.

7 Life Cycle Assessment

7.2 Functional Unit

One square meter of installed modular carpet for heavy use. The use stage is considered for one year of service life. The reference flow is one square meter of modular carpet.

7.3 Cut-off criteria

The cut-off criteria established for the study include or exclude materials, energy and emissions data. For the purposes of this study, the criteria are as follows:

- Mass – If a flow is less than 1% of the mass of the modeled product it may be excluded, providing its environmental relevance is not a concern.
- Energy – If a flow is less than 1% of the cumulative energy of the model it may be excluded, providing its environmental relevance is not a concern.
- Environmental relevance – If a flow meets the above criteria for exclusion, yet is thought to potentially have a significant environmental impact, it will be included.

The total excluded flows do not exceed 5% of overall life cycle.

7.4 Allocation

Allocations were not used in the model of this product. Where relevant, the background data incorporates some allocation as in the power mix, where possible appropriate geographical grid mixes were used.

7.5 Background data

GaBi 4 software system was used for modeling the life cycle of the modular carpet

7.6 Data Quality

For the data used in this LCA, the data quality is considered to be “good to high” quality. The definition of this quality range stems from the following descriptions. The data and data sets cover all relevant process steps and technologies over the supply chain of the represented carpet products. The LCIs from the GaBi 4 database and Plastics Europe are mainly based on industry data and are completed, where necessary, by secondary data. The operations data is representative of a sufficient sampling over and adequate period of time. The temporal correlation falls under a three year window for the vast majority of data considered. The geographical correlation is slightly challenging as there is very little life cycle information available that is country specific in every facet. For Interface, there is a reliance on data produced from European sources with country specific considerations during the LCI creation. Given that the data is from similar production conditions and representative of the technology and production paths used by Interface’s direct suppliers, this is acceptable to Interface and deemed to have an appropriate level of quality. A possible source of uncertainty from geographical sources is the incorporation of European electricity grid mixes into many of the LCIs that are used.

7.7 System Boundaries

The Life Cycle Assessment includes all relevant cradle-to-grave environmental information for one square meter of carpet. The system boundaries include raw material production and processing, carpet manufacturing, energy production, packaging, transportation, carpet installation, use and maintenance, as well as the end-of-life options recycling, incineration or landfill disposal.

7.8 Notes on use stage

The warranted service life of the product is 15 years. The use stage includes both vacuuming and extraction cleaning according to the maintenance guidelines of the Carpet & Rug Institute and

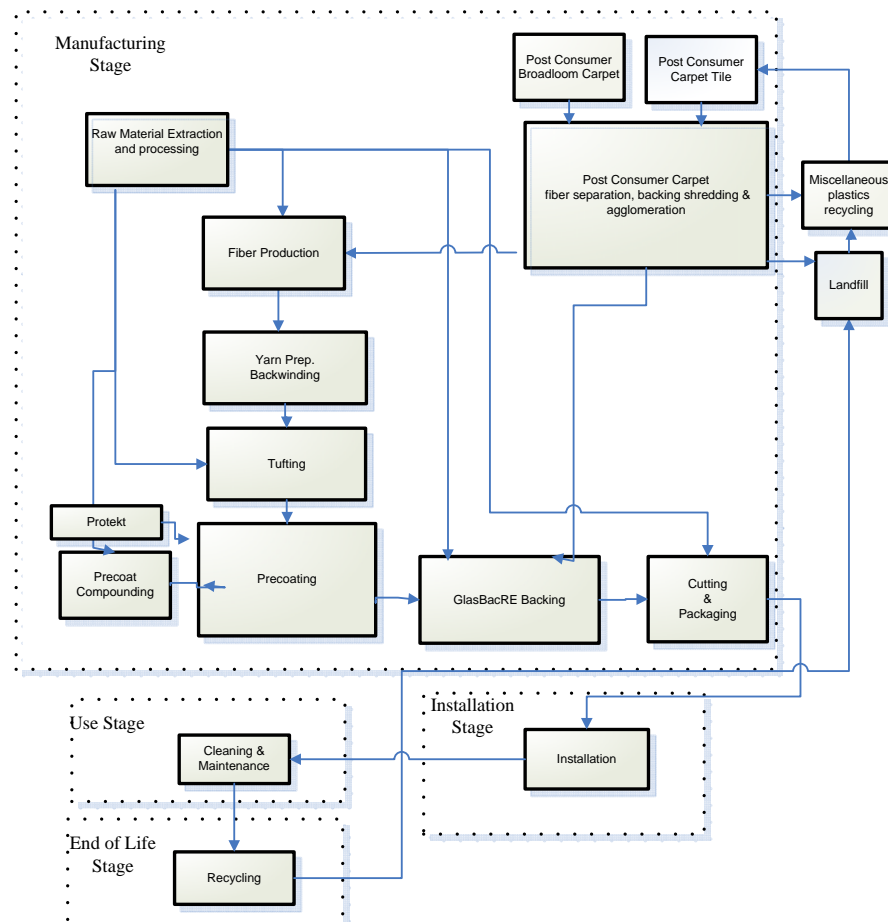
accounts for the electricity, water, and cleaning agents consumed. The use stage impacts have been annualized.

7.9 Results of the assessment

Life Cycle Stages assessed:

- Production Stage
- Installation Stage
- Use Stage
- Recycling Stage

Figure 5. Life cycle stages diagram



7.10 Life cycle inventory assessment

Figure 6. Use of total primary energy for the all life cycle stages from renewable and nonrenewable resources

	Unit	Total Life Cycle	Production			Installation	Use*	End of Life
Total Primary energy from Renewable & Non Renewable Resources	MJ	173.1	161			3.0	6.6	2.6
			Primary material	Secondary material	Internal Processing			
			126.6	3.9	30.5			

* service life of 1 year

Figure 7. Relative total primary energy by life cycle stage

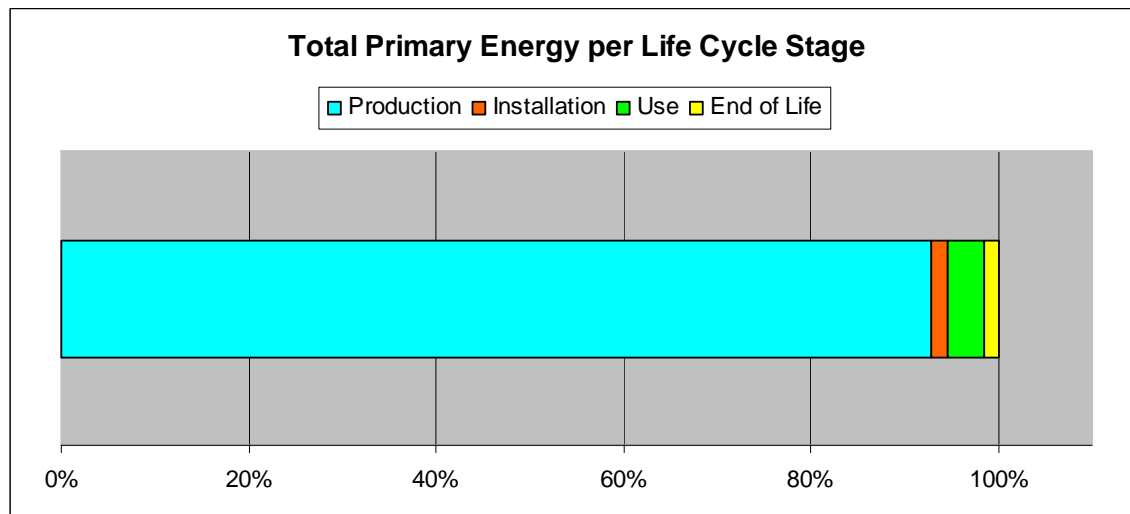


Figure 8. Total primary energy of all life cycle stages from nonrenewable resources by source type

Non- renewable Primary energy by resources	Unit	Total Life Cycle	Production	Installation	Use*	End of Life
Total nonrenewable primary energy	MJ	170.9	159.0	3.0	6.3	2.6
Crude oil	MJ	49.3	44.0	2.6	0.6	2.2
Hard coal	MJ	33.3	30.4	0.1	2.8	0.0
Lignite	MJ	1.8	1.7	0.0	0.0	0.0
Natural gas	MJ	65.8	63.7	0.3	1.5	0.3
Uranium	MJ	20.7	19.3	0.0	1.4	0.0

* service life of 1 year

Figure 9. Contribution of different resources to nonrenewable primary energy

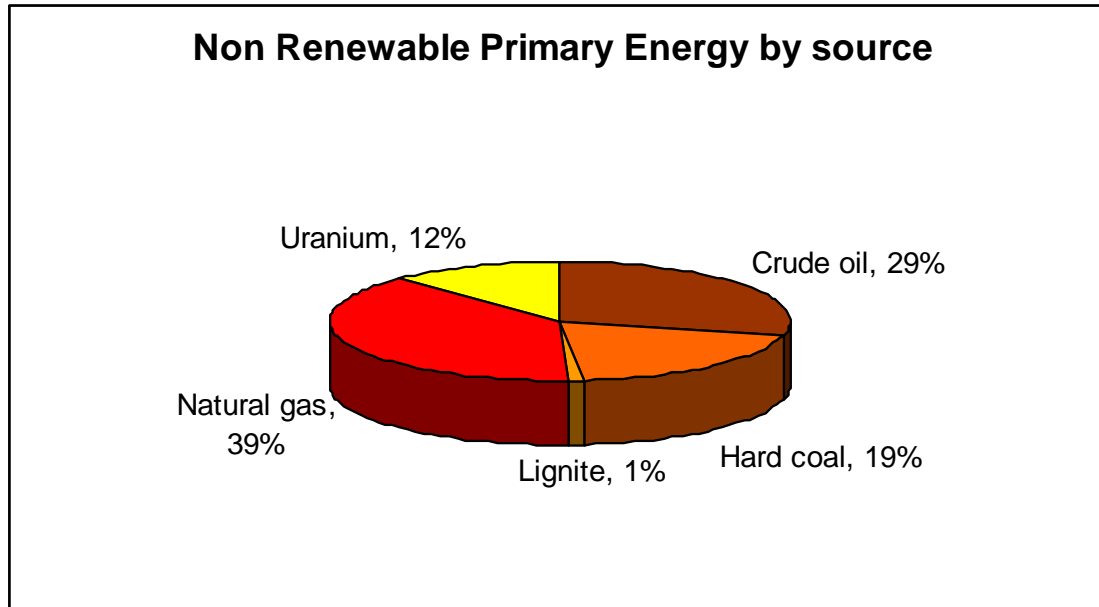
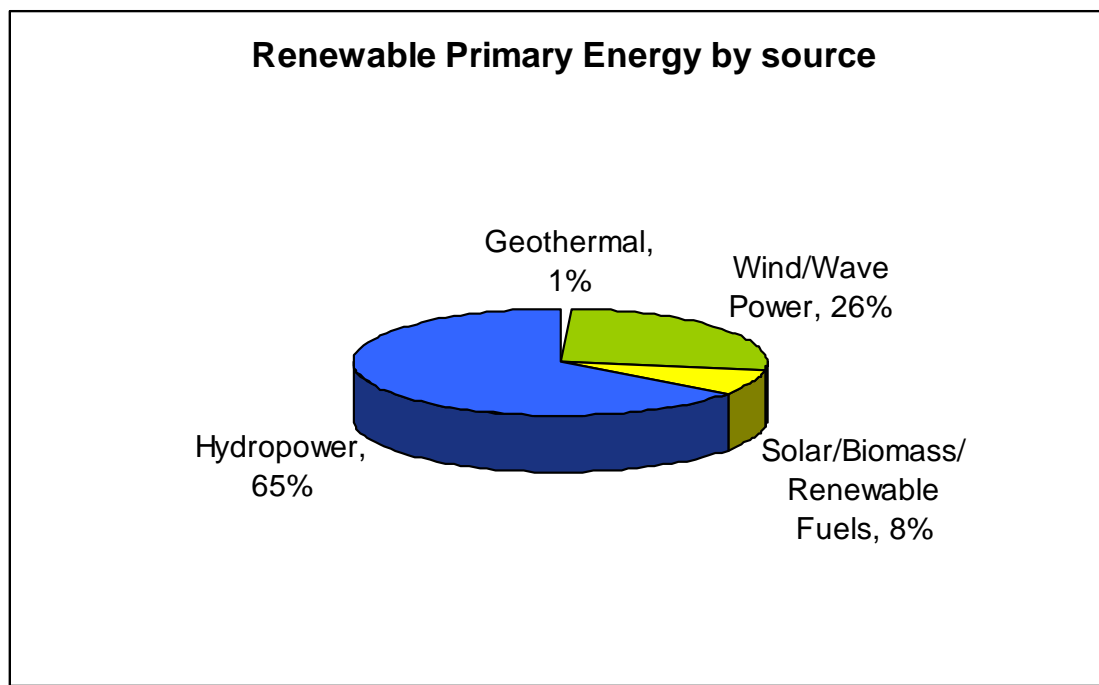


Figure 10. Total primary energy of all life cycle stages from renewable resources by source type

Renewable primary energy by resources	Unit	Total Life Cycle	Production	Installation	Use*	End of Life
Total renewable primary energy	MJ	2.291	1.987	0.009	0.281	0.015
Hydropower	MJ	1.486	1.322	0.004	0.156	0.004
Wind / Wave Power	MJ	0.605	0.484	0.000	0.119	0.001
Solar Energy / Biomass / Renewable Fuels	MJ	0.183	0.166	0.003	0.004	0.009
Geothermal	MJ	0.017	0.015	0.001	0.001	0.000

* service life of 1 year

Figure 11. Relative renewable primary energy by source type



Nonrenewable material resources, water consumption and wastes

Figure 12. Non-renewable material resources and Water Consumption by life cycle stages

	Unit/ m ² *	Total Life Cycle	Production	Installation	Use	End of Life
Nonrenewable resources	kg	6.59	5.86	0.04	0.59	0.11
Water	m ³	0.1338	0.1322	0.0004	0.0053	0.0003
Wastes						
Non-hazardous waste	kg	6.10	4.93	0.11	0.54	0.52
Hazardous waste	kg	0.04065	0.04055	0.00009	0.00001	0.00000
Radioactive waste	kg	0.00611	0.00562	0.00001	0.00048	0.00000

*resource / waste amount per square meter of product

7.11 Life cycle impact assessment

The potential impacts are presented for the manufacture, installation, use, and recycling of the carpet. The use stage is for one year of carpet life.

Figure 13. The potential impacts for one square meter of carpet

PCR Impact Category	Impact	Units
<u>US TRACI</u>		
TRACI, Acidification Air	2.7	mol H+ Equiv.
TRACI, Eutrophication Water & Air	0.005	kg N-Equiv.
TRACI, Global Warming Air	11.90	kg CO2-Equiv.
TRACI, Ozone Depletion Air	9.4×10^{-7}	kg CFC 11-Equiv.
TRACI, Smog Air	5.0×10^{-7}	kg NOx-Equiv.
<u>CML 2002</u>		
CML2002, Acidification Potential	0.05	kg SO2-Equiv.
CML2002, Eutrophication Potential	0.01	kg Phosphate-Equiv.
CML2002, Global Warming Potential (GWP 100 years)	12.1	kg CO2-Equiv.
CML2002, Ozone Layer Depletion Potential (ODP, steady state)	8.8×10^{-7}	kg R11-Equiv.
CML2002, Photochem. Ozone Creation Potential (POCP)	0.005	kg Ethene-Equiv.
CML2002, Abiotic Depletion	1.2×10^{-5}	kg Sb-Equiv.

Figure 14. Life cycle stages as a percentage of total impacts

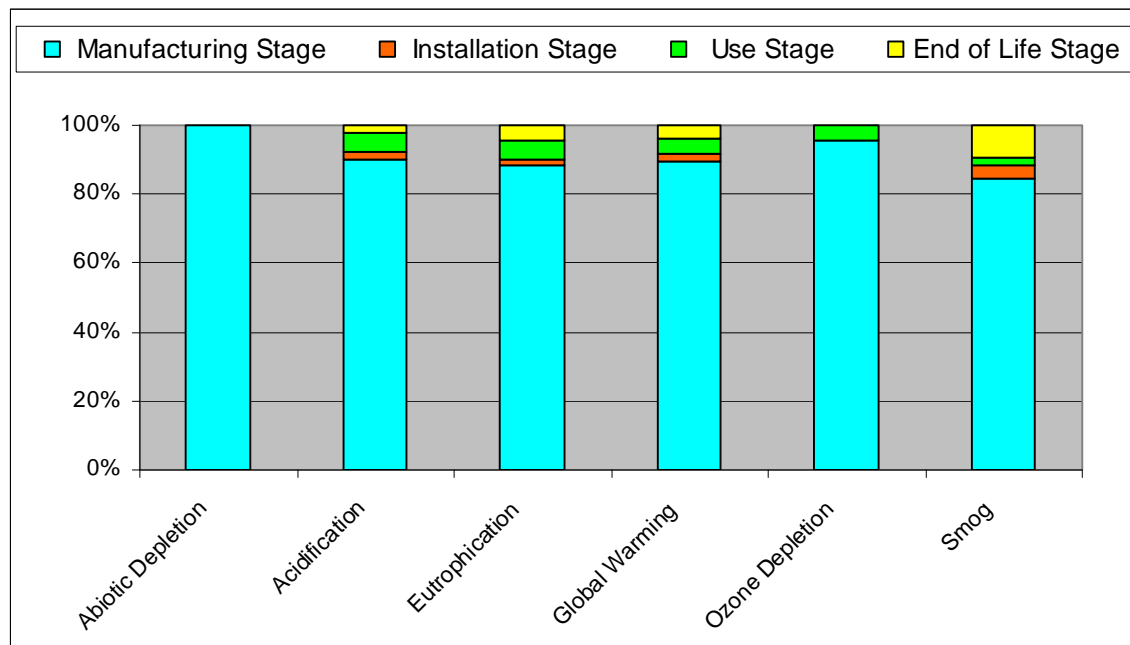
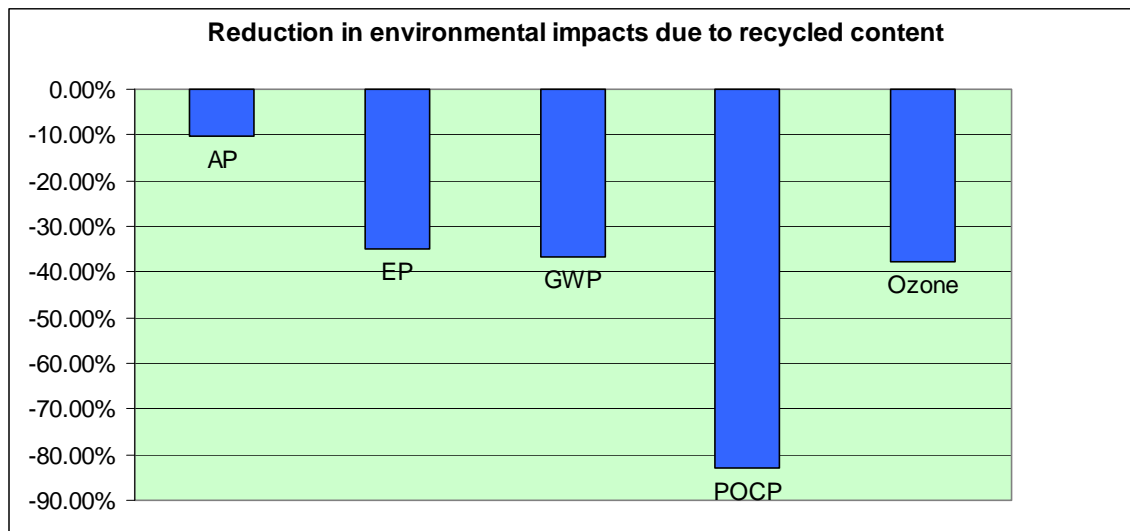


Figure 15. Distribution of the environmental impacts to the different stages of the life cycle

Impact Category	Manufacturing Stage	Installation Stage	Use Stage	End of Life Stage
Acidification	90.00%	2.47%	5.22%	2.30%
Eutrophication	88.32%	1.92%	5.57%	4.19%
Global Warming	89.37%	2.20%	4.33%	4.10%
Ozone Depletion	95.34%	0.14%	4.42%	0.11%
Smog	84.64%	3.55%	2.17%	9.64%
Abiotic Depletion	100.00%	0.00%	0.00%	0.00%

Figure 16. Reduction of impacts due to recycling



7.12 Interpretation

The majority of the environmental impacts occur during the extraction of raw materials and processing included in the manufacturing stage. The life cycle impacts of Nylon 6 are the largest contributor to the manufacturing stage. The virgin Nylon 6 in this product contributes 65% of the global warming potential in the manufacturing stage. The impacts are reduced by the use of recycled Nylon and recycled backing. The Global Warming Potential is reduced by over 36% due to the recycled content. As technology permits, Interface will continue to increase the level of recycled content in modular carpets with the intent of eventually eliminating the use of virgin materials.

Installation has minimal impact due to the modular nature of carpet tile and the innovative installation method, TacTiles. Modular carpet tile allows for lower installation waste as compared to the 8-14% waste in a broadloom installation. The Convert product platform, in addition to being a modular carpet, uses a design pattern which allows for random installation resulting in a low installation waste of two percent. Modular carpet also eliminates the need for cushion underlayment, another contributor to waste and impact. The TacTile installation method uses small connectors which attach the carpet tiles to each other, creating a floating floor. This eliminates the need for spread adhesive and all of the wastes and VOC emissions associated with wet adhesive.

application. In addition to ease of installation, the TacTile technology also supports recycling making carpet removal easier and resulting in returned carpet clean of adhesives improving recyclability.

The use stage is represented in this report for one year of maintenance. The contribution to the life cycle impact is small because carpet requires only regular vacuuming and intermittent extraction cleaning.

The end of life stage has minimal impact because this product is recycled back into new product at the end of life. Every effort is made to insure the product is returned to Interface for recycling. The ReEntry carpet reclamation program is an extensive reclamation and recycling program that recovers both yarns and backings from post consumer carpet and the program reclaimed over 18.5 million kilograms of carpet in 2008. This was on sales of over 17 million square meters of carpet or approximately 24 percent by weight.

Interface and its stakeholders share a common concern for the environment with particular interest in mitigating climate change through the elimination of product-related emissions. They have addressed this concern by creating climate neutral products. The total GHG emissions created during the life cycle of the products (raw material acquisition, manufacturing, transportation, use and maintenance, and end-of-life disposition) are modeled using Life Cycle Assessment methodology. These emissions are then neutralized through the purchase and retirement of an equivalent number of verified emission reduction credits. As a result of this program, the Convert Nylon 6 products are climate neutral. This program is verified by SGS Group (http://www.climatechange.sgs.com/home_climatechange_v2/voluntary_activites/cool_carpet_a_climate_neutral_option.htm)

COOL CARPET™ A CLIMATE NEUTRAL OPTION



SGS Verified: Interface Cool Carpet™ Program
Modeling and off-setting the life cycle greenhouse gas emissions of carpet.


SGS successfully verified **Interface's Cool Carpet program** including the modeling of **greenhouse gas (GHG) emissions** associated with the full life cycle of its carpet, and then off-setting those emissions through the retirement of an equivalent number of verified emission reduction credits.



8 Additional Information, evidence and test results

8.1 Emissions

Low VOC emissions are documented by CRI Green Label Plus certification through testing at Air Quality Sciences, test report #83960.

PCR review, was conducted by: PCR - Floor Coverings, Environmental Product Declarations Harmonised Rules for Textile, Laminate and Resilient Floor Coverings, IBU, Germany www.bau-umwelt.de <i>Program operator: The Green Standard</i> http://www.thegreenstandard.org/	
Independent verification of the declaration and data, according to ISO 14025 <input type="checkbox"/> internal <input checked="" type="checkbox"/> external	
third party verifier: <i>Dr Eva Schmincke</i> <i>Five Winds International</i> 	

9 References

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 /ASTM E-662/ <http://www.astm.org/Standards/E662.htm>